GEORGIA INSTITUTE OF TECHNOLOGY — OFFICE OF CONTRACT ADMINISTRATION

PROJECT ADMINISTRATION DATA SHEET

[X] ORIGINAL [ ] REVISION NO. ____

Project No. A-3284 C/ DATE 7-8-82

Project Director: G. F. MACKEY ~~School~~/Lab SEL

Sponsor: Industrial Development Authority, Lansdowne House, Dublin 4, Ireland

Type Agreement: Telex Agreement accepted 6/21/82

Award Period: From 6-24-82 To 8-23-82 (Performance) _____ (Reports)

Sponsor Amount: $ 8,593 Contracted through:

Cost Sharing: None GTRI/[redacted]

Title: Technical Evaluation of a Software System Developed by Convey Computers, Inc - I

ADMINISTRATIVE DATA OCA Contact Don Hasty

1) Sponsor Technical Contact:

2) Sponsor Admin/Contractual Matters:

Mr D. J. Kelly
Manager, International Services
Industrial Development Authority
LANSDOWNE House
Dublin 4, Ireland

Defense Priority Rating: N/A Security Classification: None

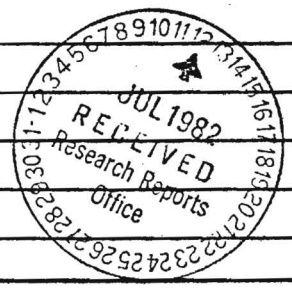
RESTRICTIONS

See Attached N/A Supplemental Information Sheet for Additional Requirements.

Travel: Foreign travel must have prior approval – Contact OCA in each case. Domestic travel requires sponsor approval where total will exceed greater of $500 or 125% of approved proposal budget category.

Equipment: Title vests with N/A - None proposed

COMMENTS:



COPIES TO:

~~Administrative Coordinator~~ RAN
Research Property Management
Accounting
Procurement/EES Supply Services
Research Security Services
~~Reports Coordinator (OCA)~~
Legal Services (OCA)
Library
EES Public Relations (2)
Computer Input
Project File
Other B. Nesbitt

FORM OCA 4:781

GEORGIA INSTITUTE OF TECHNOLOGY OFFICE OF CONTRACT ADMINISTRATION

SPONSORED PROJECT TERMINATION SHEET

Date 9/15/83

Project Title: Technical Evaluation of a Software System Developed by Convey Companies', Inc.

Project No: A-3284

Project Director: G. F. Mackey

Sponsor: Industrial Development Authority, Lansdowne House, Dublin, Ireland

Effective Termination Date: 8/23/82

Clearance of Accounting Charges: 8/23/82

Grant/Contract Closeout Actions Remaining:

NONE

- ☐ Final Invoice and Closing Documents
- ☐ Final Fiscal Report
- ☐ Final Report of Inventions
- ☐ Govt. Property Inventory & Related Certificate
- ☐ Classified Material Certificate
- ☐ Other _____

Assigned to: SEL (~~School~~/Laboratory)

COPIES TO:

~~Administrative Coordinator~~ RAN
Research Property Management
Accounting
Procurement/EES Supply Services
Research Security Services
Reports Coordinator (OCA)
Legal Services (OCA)
Library
EES Public Relations (2)
Computer Input
Project File
Other G. Mackey GTRI

FORM OCA 10:781

A-3284

GEORGIA INSTITUTE OF TECHNOLOGY

ENGINEERING EXPERIMENT STATION

TECHNICAL EVALUATION OF CONVEY COMPANIES' SOFTWARE

INTERIM TECHNICAL REPORT
EES/GIT PROJECT A-3284

by

G. F. MACKEY and C. D. GOINS

PREPARED FOR

MR. J. J. KELLY, MANAGER, INTERNATIONAL SERVICES
INDUSTRIAL DEVELOPMENT AUTHORITY
LANSDOWNE HOUSE
DUBLIN 4, IRELAND

ABSTRACT

The goal of this project was to provide the manager of International Services, Industrial Development Authority of Ireland with a technical evaluation of certain software programs developed by Convey Companies', Inc., Dayton, Ohio. The programs developed are for two systems. The first system, called IMPACTS, is designed for financial applications. It is designed to operate interactively with data structures peculiar to itself and yet the basic file structures are common to any general system. A unique feature is that information can be produced by following operating rules and without the need for any computer programming. The second system is unnamed and is a generalized version of IMPACTS.

1. Introduction

Mr. Chet Goins, Research Scientist II, visited the Convey Companies' of Dayton, Ohio from June 28 through June 30, 1982. He examined two interactive software systems with the capability to operate on data structures and provide information. The directions necessary to produce the desired results are implemented through the use of format rules rather than through written programs. More details on the functioning of these systems are included in the body of the report.

A medium-depth look at the design of both systems provided a reasonable level of confidence that sound programming procedures and concepts were applied. Unfortunately, very little computer time was available to actually exercise the existing system. A second visit to Dayton to exercise the system would give us some increase in our confidence level. However, we are not uncomfortable with the information collected and are recommending a second visit only if the depth provided in this report is considered inadequate.

This interim report is submitted to determine the sponsor's needs. Approximately $3500 (including indirect costs) has been expended to date. No further investigation will be made without direction from the sponsor.

2. Report

During the visit time period, contact was established with Mr. Al Jung (partner in ownership) and Mr. Ken Wallace (development project manager). Ken provided a system overview and design level presentation, following a background presentation by Al. Questions were primarily centered upon current system capabilities and proposed additions; little was said about competition, although the proposed market places were discussed. The other partner, Mr. Jeff Reeves, sat in on some of the discussions on Tuesday and Wednesday, but the principal contact was Ken. The following paragraphs contain an analysis and summary of the investigation performed.

The software in question in this report is divided into two systems: the current application system IMPACTS, and its near-future additions; and the "Standard", which is the ultimate system they wish to market. According to their plans, IMPACTS will be essentially a specialized subset of the standard.

IMPACTS is near completion and resides on a local banking system. It is a financial application and is sponsored by the bank. Although incomplete, IMPACTS is operational in regard to most of its functions. It was designed to operate with data structures peculiar to itself, with respect to standard structures, yet the basic file structures are common to any general system.

This subject of data structures will be pursued at length because it contributes much to the uniqueness of the system. A "data dictionary" is created to describe a collection of associated data items, each datum being

characterized by name, length, type, range, and security. These are not "record" descriptions, only the definition of each datum which can be used in a record. The records, which are data that constitute some hierarchical level (such as an individual account with name, address, etc.), are physically appended to the data dictionary which describes its elements. This means that data records can never be separated from their definitions,and that a wrong set of definitions could never be used. It also allows independent files to be constructed, each having their unique dictionaries, thus allowing for reduced data storage and independence from programming.

One very good characteristic of their system, (which however, was not demonstrated) is the capability of thorough modification. This implies that any field which is modified in the data dictionary (e.g. a change in length or type) is reflected immediately in all the data records, thus ensuring that all records are compatible with their definitions.

The two systems are principally on-line, interactive, and application oriented. There are support programs which are run in batch mode, performing tasks such as data dictionary modification or CRT display format creation, but the main usage is on-line. The CRT formats are maintained separately from the data in another file. In general, many formats (or screens) can be created to access any or all data fields. The format specifications, as demonstrated, offer a great deal of flexibility and minimal knowledge on the part of the user. In theory, a format file could be used with more than one data file non-concurrently, but in practice this would be unlikely; in general, a format file would be associated with a specific data file. The planner or operator who specifies the formats need only be knowledgable in the data dictionary and data record structure (and, of course, the format rules), to be able to bring up an application on-line.

In addition, IMPACTS offers up to 64 alternate indices into the data file, which allows for greater (and timely) access.

Internally, the on-line system is built of functional subroutines which are re-enterable. The re-enterability of all routines has been a strong emphasis throughout design and implementation. These functional subroutines are referred to as "Robots" at Convey, and they are essentially independent of data or application, which permits greater flexibility in system design, upgrade, and variety of applications.

The current on-line system utilizes some rare system software (rare outside the financial arena), namely UTAM and UFAM, which are file and access system routines. Convey has begun the process of converting to more widely acceptable system routines (VTAM, CICS) on another IBM computer system; this should be a notable improvement as far as general applications are concerned.

The "Standard" is an on-line application oriented system which utilizes the same data structures and concepts as IMPACTS, but is geared toward universal usage, as opposed to financial. One important additional feature is that of the Super-data-dictionary, which will be used to tie together several related data files,each having their own dictionaries. This will encourage multiple or cross applications while maintaining simplification for the basic applications.

In actual usage (on-line), the system performed well (3 seconds wait time) on a point-to-point network with 750 terminals. Also, it seemed fairly easy to manipulate the system, going from screen to screen and record to record. Sign-on was not difficult, either.

3. Conclusions

To summarize the visit, what was seen was received well. A medium-depth look at the design of both systems provided a reasonable level of confidence that sound programming procedures and concepts were being applied. A very important shortcoming was that very little computer time was available to actually exercise the existing system; part of a "canned" demo was presented on the 28th, and about fifty minutes of investigative computer time was utilized late on the 29th. This, of course, was insufficient time for any reasonable analysis of the implementation. This was due mostly to the fact that they were moving to another facility, and did not inform the Georgia Tech personnel before arriving in Dayton.

There was practically no documentation on the "Standard", but a large portion of the IMPACTS documentation can apparently be applied to both. The existing manuals could well be improved upon by a professional technical writer.

In regard to future marketplaces, the immediate area is in large IBM users, even time-sharing outfits. The marketability depends greatly on the "No-hassle" database concept, which frees users from systems and programming type knowledge and their related difficulties.

As for smaller systems, it seems that the concepts could be applied easily to micro or mini computers, particularly in distributed systems. However, for performance, the micro system should incorporate a 'Winchester' type disk storage. Furthermore, the on-line concept of having all functions available would be difficult to maintain in a micro; a set of functional programs would be preferable, which could be called in 'batch' mode. This would also eliminate the memory size problems which are anticipated (current on-line IBM version uses 60K and is incomplete; on a micro this could be much larger). The modification to utilize CPM and UNIX operating systems would be advisable for the small marketplace.

The application of the "Standard" to small systems (with or without reentrant code) could be very well received, particularly by manufacturers and users who wish to emphasize applications and not bits and bytes. The time frame for entering the small market would be at least a year away, even if ten people were added immediately. However, the concept is potentially great and warrants further investigation.